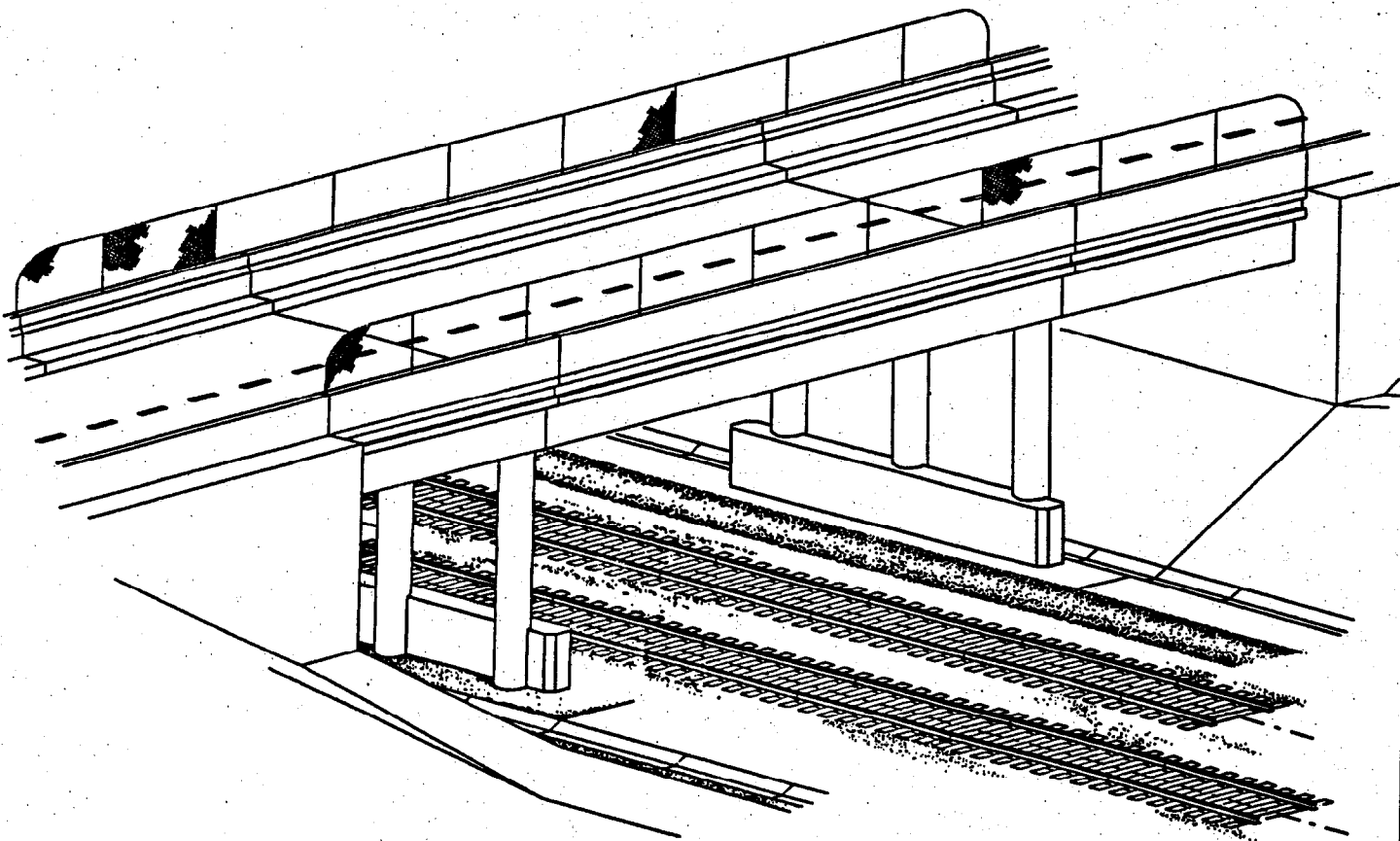


GUIDELINES FOR DESIGN OF HIGHWAY SEPARATION STRUCTURES OVER RAILROAD (OVERHEAD GRADE SEPARATION)



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INDEX

ITEM		PAGE
I	Purpose and Scope	2
II	Standard Drawings and Guidelines	3
III	Units	4
IV	New or Modified Structures	4
V	Permanent Clearances	5
VI	Construction Clearances	7
VII	Safety Barrier or Splashboards	7
VIII	Safety Fences	8
IX	Parallel Structures	9
X	Piers	9
XI	Pier Protection Walls	10
XII	Adjustments to Utilities	10
XIII	Abutment Slopes	11
XIV	Drainage and Erosion Control from Structure	12
XV	Lights	13
XVI	Review Submittals	13
XVII	Preliminary Submittal	14
XVIII	Final Submittal	17
XIX	Construction Submittals	18
XX	Appendix A	19
XXI	Appendix B	22

UNION PACIFIC RAILROAD COMPANY

OVERHEAD GRADE SEPARATION STRUCTURES

I PURPOSE AND SCOPE

The intent of this guideline is to inform public agencies, design engineers, and contractors of Union Pacific Railroad Company's current standards and requirements concerning design and construction of new or modified existing grade separation overhead structures.

To avoid delays during construction, especially in corridor lines with large railroad traffic volumes, Union Pacific Railroad recommends the use of prefabricated type structures that will minimize track interference and not require track outages during construction.

Design of overhead structures over corridor lines with large railroad traffic volume should include a sequence of construction, which does not require train service interruption. Agencies should consult with the Manager of Industry and Public Projects during the early stages of the design process to determine the operating requirements, volume of train traffic and the possibility of securing track windows for the proposed design and method of construction. If track windows are requested, the Manager of Industry and Public Projects shall consult with the Service Unit Superintendent and submit to the Manager of Structures Design any arrangements for windows or schedules that are worked out during the plan submittal. **Keep in mind that Union Pacific Railroad will not commit to something that it will not be able to keep in the future due to changes of traffic patterns or operational needs.**

The public agency or their representative shall provide information requested on the attached data sheet, to the Manager of Industry and Public Projects of the district where the project is located, in the preliminary stages of the project. See Data Sheet, Appendix A.

It is recommended that the agency or their representative complete the attached Overhead Submittal Checklist and submit to the Manager of Industry and Public Projects with preliminary or final plans of the project. See Overhead Submittal Checklist, Appendix A.

The requirements addressed in this guideline should be followed for all

structures over the Union Pacific Railroad tracks or structures constructed within the Railroad right-of-way. Compliance with the requirements herein will expedite the design review approval, and construction review submittals.

II STANDARD DRAWINGS AND GUIDELINES

Design and construction of overhead grade separation structures shall comply with the following standard drawings and guidelines:

1. Standard Drawings – APPENDIX B

The following standard drawings shall be used for design and construction of overhead structures:

- a) Union Pacific Railroad Standard Drawing **No. 0035** "Barriers and Clearances to Be Provided at Highway, Street, and Pedestrian Overpasses", current issue. See Appendix B.
- b) Union Pacific Railroad Standard Drawing **CE # 106613** "General Shoring Requirements", current issue. See Appendix B.
- c) Union Pacific Railroad Standard **UP- OH1** "Barriers, Fences, and Splashboards to Be Provided at Highway, Street, and Pedestrian Overpasses", current issue. See Appendix B.
- d) Union Pacific Railroad Standard **UP- OH2** "Typical Sections at Abutment Slope", current issue. See Appendix B.

2. Guidelines

The following Union Pacific Railroad Guidelines are separate documents and shall be used during the construction of the Overhead structures as required.

Plans or special provisions of the project should refer to them or include them in the bid documents:

- a) Falsework – "Guidelines for Design and Construction of Falsework for Structures over Union Pacific Railroad".
- b) Shoring – "Guidelines for Design and Construction of Shoring Adjacent to Active Union Pacific Railroad Tracks".

- c) Demolition – "Guidelines for Preparation of a Bridge Demolition and Removal Plan over the Union Pacific Railroad".

III UNITS

Grade Separation overhead structures that require use of metric units shall indicate all controlling dimensions in dual units. English units to be shown in parenthesis.

Controlling dimensions or elevations refer to but are not limited to the following:

- a) Horizontal and vertical clearances.
- b) Track spacing, Railroad right-of-way, track stationing.
- c) Span length, width and depth of superstructure elements.
- d) Size and limits for barrier rail or splashboards, and fences.
- e) Location and elevation of underground or aerial utilities and their relocation adjustments if required.
- f) Size, elevation and location of pier or abutment footings for spans adjacent to railroad tracks.
- g) Size of structure supports (pier or abutment walls, columns).
- h) Size and elevations of pier protection walls if required.
- i) Shoring location and their limit if required.
- j) Top of rail elevation under structure and grade profile.
- k) Size and location of drainage structures and ditches.
- l) Temporary construction vertical or horizontal clearances if required.

Plans shall be rejected if required controlling dimensions are not shown or not shown properly.

IV NEW OR MODIFIED STRUCTURES

New overhead structures are defined as any structure being constructed over the Railroad tracks at a location where no crossing currently exists or replace an existing at grade crossing. All new structures shall be designed to provide for one or more future tracks as required for long range planning or other Railroad operating requirements and additional room for an access roadway. Where provisions are made for more than two tracks, space is to be provided for access roads. Designer should consult with Manager of Industry and Public Projects first and or the Director of Project Design in Omaha for the track requirements at each location. The Manager of Industry and Public Projects should not be bypassed on any discussions. **The current issue of Union Pacific Railroad standard drawing 0035 indicates only minimum requirements.**

Modified existing structures are defined as those structures being modified or

replaced with a new structure. All modified structures shall comply with the applicable minimum requirements shown on the current issue of Union Pacific Railroad standard drawing 0035, when the following modification to the structure is proposed:

STRUCTURE MODIFICATION	COMPLY WITH REQUIREMENTS FOR
Total deck replacement	Fence, Splashboards, Lighting, if applicable
Total replacement of existing railing	Fence, Splashboards
Total replacement of superstructure	Vertical clearances, Fence, Splashboards, Lighting, if applicable
Total replacement of existing structure	Treat replacement structure as New structure
Widening deck of existing superstructure	Fence, Splashboards, Lighting, if applicable
Widening existing structure	Provide Pier protection walls if required or modify existing walls to comply with current AREMA requirements
Multiple parallel structures	Treat each structure as an individual structure

V PERMANENT CLEARANCES

It is preferable on all new overhead bridge structures to have all piers and abutments located outside the Railroad's right-of-way and parallel to the tracks. Permanent clearances shall comply with current issue of drawing 0035, with provisions for future tracks, access roads, and drainage ditches.

Any variation of horizontal or vertical clearances shall be treated as a special case and will require approval by the Chief Engineer Design.

A. VERTICAL CLEARANCES

Minimum permanent vertical clearance shall be twenty-three (23) ft. above the top of rail for **ALL** tracks and at any location under the structure. Additional vertical clearances may be required for features beyond those shown in the standard drawing; such as correction of sag in the track, track raise, construction

requirements, and future track raises (within the next five years).

Design plans shall prominently display a note stating: **"The elevations of the existing top-of-rail profile shall be verified prior to beginning construction. All discrepancies shall be brought to the attention of the Chief Engineer Design and corrected prior to construction."**

The minimum horizontal and vertical clearances as well as the existing clearances of structures to be rehabilitated or replaced shall be indicated on the General Plan and Elevation.

B. HORIZONTAL CLEARANCES

Layout of ALL overhead structures shall provide ample space for access roadway at least on one side of the track. For multiple tracks, space is to be provided for access roadway on both sides and in between tracks if required by the Service Unit Superintendent for servicing trains. Designer to consult with the Manager of Public Projects for the requirements and location of access roadway.

Minimum horizontal clearance on tracks without access road shall be eighteen (18) ft. to the face of pier protection wall, and twenty-five (25) ft. on tracks with access road. Horizontal clearances are for tangent tracks and correspond to the perpendicular distance from centerline of the track to the face of support or pier protection wall.

The layout of proposed structure shall take into consideration the following:

1. Future tracks and their relative location.
2. Spreading of tracks and direction of spread.
3. Location of access road.
4. Location and size of drainage ditches.
5. Location of existing or relocated utilities.
6. The minimum horizontal clearance requirement is for tangent track layout. Horizontal clearances shall be increased per AREMA requirements when any part of the structure is located within eighty (80) ft. section of curved track.

VI CONSTRUCTION CLEARANCES

A. VERTICAL CLEARANCE

The minimum temporary construction clearance to any falsework part shall be twenty-one (21) ft. vertically above the top of the highest rail. Falsework designers must check the supporting members for deflection and allow for said deflection, with a factor of safety, during erection of the falsework, construction, and the removal of falsework elements. **Dropping of falsework or any other construction material on the tracks is not permitted.**

B. HORIZONTAL CLEARANCE

The minimum temporary construction clearance to any falsework part shall be twelve (12) ft. from the centerline of the nearest track measured perpendicular to said track.

Temporary horizontal clearances shall be adjusted per **AREMA** requirements when structures are located within eighty (80) ft. of a curved track.

Greater clearances may be required for special cases to satisfy local operating conditions. Designer shall consult with the Manager of Industry and Public Projects for locations where additional clearance is required.

Temporary vertical and horizontal clearances shall be shown on the plans for all overhead structures.

No variation to any temporary clearances (vertical or horizontal) will be allowed without written authorization from the Chief Engineer Design.

VII SAFETY BARRIER AND SPLASHBOARDS

Designers of overhead structures shall provide means of protecting Railroad facilities and to maintain the safety of employees below the structure from snow removal activities and errant vehicles.

ALL structures where snow removal is being performed shall have splashboards as indicated in Union Pacific Railroad standard drawing 0035. Structures requiring snow protective devices shall have a high solid barrier railing of 3'-6" minimum height or a combination of a lower solid barrier railing and splashboards on top for a total height of five (5) ft. For details see current issue of drawing 0035 and drawing **UP - OH1 Appendix B.**

A variance to the solid 3'-6" high barrier railing or splashboards which is based on not removing snow laterally from the bridge will require a clause to that affect in the agreement between the Agency and the Railroad. **Final plans shall not be approved without copy of such agreement between the Agency and Railroad.**

The limits of snow protective devices shall extend to the full length of Railroad's right of way or a minimum of twenty-five (25) ft. beyond the centerline of exterior track or access road. Addition of future tracks shall require the lengthening of the snow protective devices at the expense of the agency.

Standard solid barrier rail will be acceptable on structures where snow removal is not performed.

Types of barrier railing or combination of barrier railing and splashboards and their limits on the structure shall be clearly shown on the plans.

VIII SAFETY FENCES

Designers of overhead structures shall provide means of protecting Railroad facilities and the safety of their employees below from objects being thrown from above by pedestrians or passing motorists.

Fence shall be provided on both sides of **ALL** overhead structures. For types of fences see current issue of standard Union Pacific Railroad drawing 0035 and drawing **UP - OH1** Appendix B.

Designer shall provide eight (8) ft. high curved fence or ten (10) ft. high straight fence on the side of walkway and a combination of barrier rail and fence of total height of ten (10) ft. on the side without walkway.

Keep in mind that the protection and safety of rail operations and the Union Pacific employees that may be working on the ground beneath the bridge is absolutely paramount. Any variance to fence requirement above shall not be granted unless the Manager of Industry and Public Projects consults with local Director of Track Maintenance (DTM) and his concurrence is submitted to the Manager of Structures Design with the plans for approval.

If variance is granted a clause in the Agreement between the Agency and the Railroad shall be included that the Agency shall provide for future installation of fencing at the Agency's expense if deemed necessary by the Railroad.

Aesthetics shall not be cause for not meeting the safety requirements.

The Chief Engineer Design will consider ornamental fencing with a maximum gap of four (4) inches and meeting the minimum height requirements above.

The limits of protective fence shall extend to the full length of Railroad's right of way or a minimum of twenty-five (25) ft. beyond the centerline of outermost track or access road. Any addition of future tracks shall require the lengthening of the safety fences at the expense of the agency.

Types of fences and their limits shall be shown on the plans.

IX PARALLEL STRUCTURES

Parallel structures which are up to two (2) ft. apart shall not require safety fence or snow protective devices at their interface. Structures which are more than two (2) ft. apart shall be treated as individual structures and the required safety protective devices (barrier, splashboards, and fences) shall be provided.

X PIERS

All piers and abutment slopes shall be located so that they do not interfere with the drainage ditches or the natural drainage features of the area. Where conditions make this impractical, an explanation of such conditions shall be submitted along with the drainage plans and supporting calculations to the Office of the Chief Engineer Design for approval.

Anticipated location of piers located within twenty-five (25) ft. from centerline of the nearest existing or future track shall be designed with pier protection wall. Footings shall be placed in such a location, where construction shoring will conform to CE 106613 minimum excavation distances.

Pier footings within twenty-five (25) ft. of the nearest track centerline shall be a minimum of six (6) ft. below base of rail. This will not restrict Railroad from modifying longitudinal drainage system in the future or from providing unobstructed area for placing, signal, fiber optic lines or other buried utilities.

Drilled shafts within the influence of track surcharge shall be designed with temporary casing to protect track against cave-in, subsidence and/or displacement of surrounding ground. Casing shall be designed for live load due to the railroad surcharge in addition to all other loads.

Drilling of shafts or shoring construction for footings within the influence of track surcharge shall not proceed without the approval from the Chief Engineer Design. For limits of track surcharge influence refer to Union Pacific Railroad Standard

XI PIER PROTECTION WALLS

Piers supporting bridges over railways and with a clear distance of less than twenty-five (25) ft. from centerline of nearest or centerline of anticipated future track shall be of heavy construction or shall be protected by a reinforced concrete protection wall.

Design of pier protection wall shall comply with the requirements of **AREMA** Chapter 8, Part 2 Section 2.1.5.1. See Commentary of this section on **AREMA** specifications and Figure C-1 for additional details.

In locations where tracks are on both sides of pier and are less than twenty-five (25) ft. from centerline of adjacent tracks both sides of the pier shall be protected with protection walls.

If pier design requires column isolation, the pier protection wall shall be designed to resist the impact and redirection of equipment in case of derailment, supported on an independent footing.

ALL replacement or modified structures shall comply with the **AREMA** requirement for pier protection walls.

In locations where pier columns and protection walls interfere with drainage, openings must be provided in the wall for the drainage to ditches or drainage facilities must be provided to collect and dispose water to the drainage system. Openings in the pier protection wall must be lower than the track subgrade elevation and must drain away from the track.

AREMA defines pier of heavy construction as: "Piers shall be considered of heavy construction if they have a cross-sectional area equal to or greater than that required for the pier protection wall and the larger of its dimensions is parallel to the track". For a single column the minimum cross-sectional area is 30 sq. ft. (12' length x 2.5' width = 30 sq. ft.). Columns with 30 square ft. area must have the larger dimension parallel to the track (such as 5' x 6' column with the 6' dimension parallel to the track is considered as heavy construction column). Round columns may not meet the heavy construction criteria.

XII ADJUSTMENT TO UTILITIES

Existing underground or aerial facilities interfering with new structure shall be placed underground and away from the bridge structure. Relocation of utilities shall be

performed by the owners of the utility at the sole expense of the Agency.

Relocation of non-railroad owned utilities or communication lines shall be coordinated with the owners and submitted to the Union Pacific Real Estate Department for handling.

Any Fiber Optic adjustments shall comply with current Union Pacific Railroad Fiber Optic Rules Construction and Engineering Standards Manual. For more information call 1-800-336-9193.

XIII ABUTMENT SLOPES

To prevent embankment material from sloughing and drainage waters from undermining track subgrade, end slopes of abutments adjacent to railroad tracks shall be protected with paved slopes.

Paved slopes shall extend two (2) ft. past the face of abutment wall and terminate with either a curb or gutter to divert runoff. Paving shall consist of a prepared sub-base and filter fabric with a minimum of four (4) inches thick reinforced concrete or grouted rip-rap placed on prepared sub-base and filter fabric. Asphalt pavement for slope protection shall be considered only if proper design and method of installation is submitted or covered in the special provisions.

Toe of slopes shall terminate at the bottom of drainage ditches and must have a cut-off wall as required to protect slope from drainage erosion.

Slope layout shall provide for a minimum drainage ditch or ditches required by hydraulic studies in the area. See drawing UP – OH2 for details Appendix B. At all times the toe of slope shall be below the finished track or roadway subgrade and provide a ditch for positive track drainage.

If layout of abutments, piers, or columns with crash walls interfere with the drainage ditches, the designer shall provide other means of handling the longitudinal drainage issues based on the local drainage study.

Track drainage ditch limits shall be shown to scale on the project plans and show the distance from centerline of nearest track. A typical cross section detail shall be shown on the plans depicting the intersection of slope and drainage ditch.

XIV DRAINAGE AND EROSION CONTROL FROM STRUCTURE

Maintaining the existing drainage and providing for future drainage improvements is of the utmost importance in layout of overhead structures.

Drainage from structure shall be diverted away from the Railroad right-of-way at all times. Scuppers from deck shall not be permitted to discharge water onto the track or roadway areas at any time. If drainage of deck uses downspouts in the columns, then they shall be connected to the storm drain system or allowed to drain into drainage ditches. Concrete splash block or aggregate ditch lining will be required at the discharge area of downspouts. Downspouts shall be behind the face of the piers and their outflows drain into drainage ditches.

If structure drainage is carried outside the Railroad right-of-way and does not change the drainage conditions within the Railroad right-of-way then improvement of existing drainage will not be required.

If the proposed bridge structure will not change the quantity and/or characteristic of the flow in the railway's ditches and/or drainage structures; the plans shall include a general note stating so.

Drainage plans shall be included with the plan submitted for review. These plans must include hydrologic computations indicating the rainfall intensity and duration of the design storm used as well as the method of analysis. Drainage structures shall be designed for a 100-year flood event so that the water surface elevation does not exceed the track subgrade elevation. Where project design calls for the drainage flow to increase through the railroad right-of-way, methods must be developed to carry the additional flow.

Lateral clearances must provide sufficient space for construction of the required standard ditches parallel to the standard roadbed section.

When the proposed construction will change the quantity and/or characteristic of flow in the existing ditches, the ditches shall be modified as required to handle the increased runoff. The size of ditches will vary depending upon the flow and terrain and should be designed accordingly.

In order to evaluate the impact of the new structure relative to existing site drainage, cross sections perpendicular to the centerline of track shall be submitted along with the drainage plans. Cross sections should be submitted to adequately depict the site condition, however, a minimum of five (5) cross sections on each side of structure will be required at 50' intervals. The existing or proposed railroad ditch and the proposed toe of slope shall be shown on the applicable cross sections.

Approval of the drainage plan does not relieve the submitting agency and/or designer of ultimate responsibility and liability for the adequacy of the drainage design.

XV LIGHTS

Designer to provide lighting for ALL new overhead or modified structures exceeding eighty (80) ft. of superstructure width, except if such structure are located in rural area. Lighting shall be provided also for structures of less than eighty (80) ft. widths in areas that switching is performed, high vandalism or trespassing has been experienced.

Designer to provide temporary lighting for ALL falsework designs irrespective of the superstructure width in areas that switching is performed, trespassing or vandalism has been experienced in the past.

The minimum design criteria shall be that designer maintain an average of one (1) foot-candle for area under the structure at the Union Pacific Railroad tracks. Use Holophane module 600 underdecking type luminaries or equal as required. Fixtures shall be installed on the column walls or caps of the overhead structure without reducing the minimum clearances.

Maintenance of lights shall be the responsibility of the agency. Access to perform any maintenance for lights shall be coordinated with the local Service Unit Superintendent or his representative.

Structures with separation over ten (10) ft. from each other shall be considered as independent structures for the purposes of lighting.

XVI REVIEW SUBMITTALS

Submittals for design and construction of Grade Separation projects shall be coordinated and submitted through the Manager of Industry and Public Projects of the region in which the project is located. To expedite reviews, submittals must be complete, clearly explained and orderly. The Manager of Structures Design shall review overhead structures in the office of the Chief Engineer Design and/or through an outside consultant at the expense of the owner.

Prior to any review, Manager of Industry and Public Projects shall receive authorization from the agency agreeing to pay all review costs for the design and construction phases of the project. Once such an agreement is established, Manager of Industry and Public Projects shall request and secure an internal Work

Order to cover review expenses. Review expenses shall include all costs for in house personnel and/or consultants retained by the Railroad for the purpose of review of that particular project. All reasonable costs incurred by the Railroad during the plan review process and construction phase of the project will be fully recoverable from the agency.

XVII PRELIMINARY SUBMITTAL

Plans for preliminary overpass bridge submittal shall include the following:

For each overhead structure the milepost and direction shall be shown on the plans. Items shown as left or right in the checklist are referenced facing the increasing milepost. Milepost and direction shall be shown on the General Layout Sheet. Designer to consult with Manager of Public Projects for the correct milepost and increasing direction.

Plan:

Plan view shall indicate at least the following items:

- a) Union Pacific Railroad Company right-of-way.
- b) Footprint of proposed structure including existing structure if applicable.
- c) Indicate the position of all railroad tracks and identify each track as mainline, siding, spur, etc.
- d) Indicate minimum horizontal clearances and track spacing of all existing and/or future tracks.
- e) Indicate location of ALL access roadways.
- f) Footprint of footings with the minimum clearance from centerline of adjacent or future track shall be shown on the plans.
- g) Indicate the minimum clearance requirement for shoring.
- h) Locate and show all existing facilities and utilities and their proposed relocation if required.
- i) Indicate location of access roadways.
- k) Show drainage ditches and direction of flow.

- l) Indicate minimum structure separation for parallel structures.
- m) Indicate milepost and increasing direction.
- n) Indicate point of minimum vertical clearance, and location from the nearest track.

Elevation:

Elevation view shall indicate at least the following items:

- a) Minimum vertical track clearances taken from top of rail.
- b) Track elevation for all tracks.
- c) Pier footing within 25' of the nearest existing or future track location shall be six (6) ft. below base of rail.
- d) Indicate top of pier protection wall elevation relative to top of rail elevation.
- e) Show elevation of existing or relocated utilities.
- f) Show slopes and specify type of paving. Toe of slope shall be shown relative to drainage ditch and top of subgrade.
- g) Show ditches for drainage. Provide enlarged scaled detail showing the correlation of slope pavement, ditch, and track or roadway subgrade.
- h) Limits of fencing and protective railing or splasboards.

Typical Section:

Typical section shall indicate at least the following items:

- a) Structural components of superstructure shall be shown on the plans.
- b) Type of railing and fencing and their heights.
- c) Indicate pier outline and pier protection wall. Additional cross section may be required to show crash wall design.

Track Profiles:

The profile of the existing top of rail (1000 ft. each side of proposed structure) shall be shown on the plans.

Variance to this requirement shall be granted only if local Director of Track Maintenance concurs that the existing track grades and proposed 23' vertical clearance is satisfactory for any future ordinary track maintenance raises. Manager of Industry and Public Projects will consult with the Director of Track Maintenance and submit recommendations to the Manager of Structure Design with the plan submittal or variance request for track grade requirement.

General Notes:

General notes specifying material requirements, design data, temporary clearance requirements, stages of construction etc.

Fill out and furnish the attached "Overhead Submittal Checklist" (see Appendix A) with your preliminary plan submission. For any exception to the minimum requirements on the attached checklist, a detailed explanation/reason why the minimum requirements cannot be met must be provided.

Four (4) sets half size preliminary plans shall be submitted to the Manager of Industry and Public Projects. Manager of Industry and Public Projects shall submit two (2) sets of plans to the Manager of Structures Design. Allow four (4) weeks for in-house review by Manager of Structures Design or outside consultant, from the time plans are received. All replies will be returned to the Manager of Industry and Public Projects for handling with the agency.

Revised submittals of plans or documents shall follow the same procedure as the initial submittal until all issues are resolved.

XVIII FINAL SUBMITTAL

Three (3) sets half size 100% plans, two (2) sets of special provisions and two (2) sets of hydraulic calculations if needed are required. All final documents submitted for approval to the Manager of Industry and Public Projects must be **"signed and stamped by a Registered Engineer"**. Material to be reviewed by the Manager of Industry and Public Projects who will forward one (1) set of each to the Manager of Structures Design. Four (4) weeks shall be allowed for review. When review is complete the Railroad or its representative (consultant) shall advise the agency or their representative that all issues have been addressed satisfactorily and recommending the release of structure for construction. Copy of reply shall be mailed to the Manager of Structures Design as well as the Manager of Industry and Public Projects.

Final Plans:

Final plans for overhead structures submitted to Union Pacific Railroad should include only pertinent drawings that impact the Railroad. Complete sets are not required. The following drawings should be submitted:

- a) General plan and elevation view.
- b) Typical roadbed section and drainage ditches
- c) Track profiles
- d) Drainage plans and deck drains
- e) Railing and fencing details.
- f) Crash wall plans

Drainage Calculations:

In addition to drainage plans calculations shall be submitted for review for modified drainage conditions. Two sets of design calculations shall be submitted.

Drainage design criteria for right-of-way drainage ditches, drainage structures parallel to or under the track shall comply with the following:

- a) The 50-year flood water surface elevation should not come into contact with the crown of a culvert or the low chord of the drainage structure whichever is applicable.

- b) The 100-year flood water surface elevation should not exceed the track subgrade elevation.
If existing drainage facilities do not meet the design criteria above, an enlarged opening must be considered.

Special Provisions:

Two sets of *signed* project special provisions shall be submitted for review by Railroad.

XIV CONSTRUCTION SUBMITTALS

During construction of the overpass structure the Railroad requires the review of temporary structures such as Falsework, Shoring, Demolition of existing structures if required, etc. **prior** to any construction. It is required that all designs be submitted by the agency or their representative to the Union Pacific Railroad Company for review following their own review and approval of the design. All submittal designs shall be **"signed by Registered Engineer"** shall be forwarded to Manager of Industry and Public Projects who in turn will send them to the Manager of Structures Design. Manager of Structures Design shall perform or have an outside consultant review said submittals. If consultant performs said review the consultant may reply directly to the agency or their representative after consultation with the Manager of Structures Design. Copy of reply will be mailed to Manager of Structures Design as well as the Manager of Industry and Public Projects. During the review process, the consultant and design engineer will be free to communicate and resolve issues. Review of design submittals will require minimum of four (4) weeks.

It is preferable to receive construction submittal plans in half size.

Following is a list of construction design submittals:

SUBMITTAL	PLANS REQ'D	CALCS REQ'D	MINIMUM REVIEW TIME
Shoring	3	2	4 weeks
Falsework	3	2	3 weeks
Drainage	3	2	4 weeks
Demolition	3	2	4 weeks
Special Provisions	2	N/A	4 weeks